

# THE LEISURE HOUR.

BEHOLD IN THESE WHAT LEISURE HOURS DEMAND,  
AMUSEMENT AND TRUE KNOWLEDGE HAND IN HAND.—*Conquer.*



MR. GOLDIE HEARS OF OTHER TROUBLES.

## LOMBARDY COURT:

A STORY OF THE CITY AND THE SEA.

### CHAPTER XXV.—A CRISIS.

“—Here’s my hand.”  
“—And mine; with my heart in’t.”  
—*Shakespeare.*

FROM this time forth there was war, none the less bitter because not open and declared, between Mr. Jones and the manager. Mr. Jones looked his

adversary in the face defiantly every time he came into the clerks’ office; but the latter was, or seemed to be, unconscious of it, and never lifted his eyes to meet his gaze. They never exchanged a greeting nor spoke to one another, except in the shortest possible terms under the exigencies of business. In this kind of warfare Mr. Huxtable had a decided advantage, for while Mr. Jones could only “look daggers,” Mr. Huxtable pierced his adversary to the heart by continued ill-usage of the books, which he treated

## LOMBARDY COURT:

with the grossest indignity. He would wet his finger to turn over the leaves, even in Mr. Jones's presence, would make ticks or memoranda in the margins with ever-pointed pencils which never would rub out. It was useless for Jones to remonstrate, Huxtable could not be bothered about trifles, he said. So that at last Mr. Jones's official life became a burden to him. He could no longer take any pleasure in his work; and the books, instead of being a delight, were a daily mortification. He had found out where the little discrepancy lay, which had so long troubled him, and had got his balance right, though he could scarcely yet believe that the error had been of his own making. He had also made more than one effort to enlist the sympathy of his chief on the disfigurement of his ledger, but without success. Mr. Goldie had promised to speak to Huxtable, but it was evidently an unpleasant task, and whether he kept his word or not, nothing came of it.

At length, one Saturday afternoon, Mr. Jones, after he had put away his books in the iron safe, sealed up the key in a strong envelope, and directing it to Messrs. Goldie Brothers, took it upstairs and laid it upon Mr. Goldie's table before his face without saying a word.

"What is that, Mr. Jones?" said the merchant, peering down at it; "a letter for me?"

"No, sir; the key of the iron closet, sir."

"Why do you bring it to me? Are you going out for a few days?"

"Did not Mr. Huxtable tell you, sir? I gave him due notice."

"Notice! no. I heard nothing about it. How long shall you be absent?"

"Mr. Goldie," said the old clerk, after two or three attempts at speaking, "I am going—for good."

"Going! you! Not going to leave the counting-house, Mr. Jones? You don't mean that?"

The old man dared not trust himself to speak again, but nodded slowly, and, turning away, looked out of the window, contemplating the houses on the opposite side of the court, sternly.

"What is it? what is it?" said Mr. Goldie, impatiently, rising and walking about the room.

"My books will be found correct," said Mr. Jones; "they are soiled, blotted, disgraceful in appearance, not fit to be looked at; but they are at least complete and honest; they have never been tampered with so far, I hope."

"Of course; of course. Why do you tell me this, and what has put it into your head about leaving?"

The old man tried to answer; but he was touched by the sorrowful tones of Mr. Goldie's voice and his evident concern, and could only shake his head grimly, while fumbling in his pocket for his hand-kerchief.

"There, there!" said Mr. Goldie, "think better of it, Jones. If you knew how I am worried you would not do this. I'll speak to Huxtable. I'll tell him he mustn't—I'll tell him he mustn't—Shake hands, old friend."

Mr. Goldie also was fumbling in his pocket now. "Sit down," he said, leading his old clerk to a chair.

Mr. Jones would hardly have taken such a liberty, though bidden thus; but his knees were shaking under him and his head beginning to swim. He could no longer see across the court, nor even discern his master's face plainly. He took the chair, therefore, which was offered him, and Mr. Goldie resumed his own seat opposite to it. For a few moments

neither of them spoke. The latter then broke silence. "Why, Jones," he said, "if you were to leave me there would hardly be one of the old faces left downstairs."

"No, sir."

"It was a terrible blow to me, losing Mr. Peterson. I did not say much about it, but I felt it, Jones, more than I should have thought possible; and under such painful circumstances, too. I feel it more and more every day."

This was quite true. Mr. Peterson's market value had never been fully understood while he was alive, nor until these troubles and annoyances had made themselves felt under his successor. Mr. Goldie had been, to do him justice, attached to his late manager, but he would not have remembered him with nearly so much regret if his place in the establishment could have been equally well filled after his death. He had never been on such familiar terms with Mr. Jones, of course, but the thought of losing him just now was not only painful but alarming. How could he manage without him? What new troubles might not his departure bring upon him?

"It's all through Mr. Huxtable," said Jones, at length. "I never thought that I should have left this house while I could do my duty in it. But I can't satisfy him, nor myself, nor anybody else now."

"You satisfy me, Mr. Jones."

"How am I to know that, sir? I never bring the books up to you myself as I used to do, and I should be ashamed of them if I did. Mr. Huxtable always says they must go through him. You know how he sits in his room at the other side of the landing, with his door wide open, just opposite yours. If anybody comes upstairs he calls out and stops them. Nobody can have a word with you now, Mr. Goldie. Most of the gentlemen even who used to come to you on business are stopped on their way by Mr. Huxtable. I should not have got to see you now if he had not been out."

"He does it to save me trouble, Jones," said Mr. Goldie, with a look of vexation; "but I'll speak to him. I'll make a change. How is it that you can none of you get on with Mr. Huxtable?"

"Ah, sir! he is not like Mr. Peterson. Mr. Peterson always made himself pleasant and friendly. The clerks would do anything for him. Mr. Huxtable is too stand-off. He wants to be like you."

"Like me?" said the merchant, wincing a little.

"Yes, sir; begging your pardon, it's your place, you know, but it's not his. He comes and goes without so much as saying 'Good morning,' or 'Good night,' or 'How are you to-day?' or anything of the sort. Never a pleasant word for anybody. Mr. Peterson was so different. Ah!" Mr. Jones looked at his mourning ring, on his right hand now permanently, and sighed.

Mr. Goldie could not but feel that Mr. Huxtable's manner towards the clerks below was very much like his own, to be sure; but then, as Mr. Jones had sensibly remarked, it was a different thing with him. Besides, it was only habit in his case, and his natural feeling of reserve, whereas in Huxtable it was uppishness and pride. The clerks could not be expected to take it from him, and Mr. Goldie could not blame them for making this distinction. Still he felt a little sore at the implied reproof to himself.

"You know, Jones," he said, "I'm not a man of many words, but it's not for want of proper considera-

tion or respect for those whom I employ. I know how to esteem a good and trusty helper, and I know now, better than I ever did before, what it is to lose one. I hope I shall not lose you, Mr. Jones; and if you think you ought to have some increase of salary—you are not so young as you used to be, you know—we are both growing old together—”

“It's not that, sir; if it was I'd say so.”

“Then you'll stay, won't you? Why, Jones, you and I have been in the house together so long that if you were to go I think I should have to go also!”

“Don't say another word, Mr. Goldie; if you bid me stay, I'll stay. Only if I could have my books under my own charge, and nobody to touch them but myself—”

“Yes, yes; I'll see to it. Thank you, Jones; thank you.”

“Oh! don't thank me, sir; thank *you*, Mr. Goldie,” and taking up the keys from the table the old man hastened out of the room. He looked defiantly at Mr. Huxtable's door as he passed it. What did he care for Huxtable now? If there had been as many Huxtables in the house as there were tiles upon the roof around him, he would have been ready to withstand them all. He would stay in the office now as long as his employer, if he lived; that was settled, and he and Mr. Goldie would make common cause against the enemy. More pay? No; he did not want more pay. A kind and friendly recognition of his services; a genuine expression of sympathy between man and man, employer and employed; an acknowledgment of the mutual interests which existed between them,—this had done more to win Mr. Jones's heart than any amount of money could have effected. Henceforth his books, dear as they were to him, would hold but a second place in his regard; and the interest which he had always taken in the business would be enhanced by a consciousness of mutual esteem and good-fellowship between his master and himself. He shifted the ring back to his left hand again, ready to recommence his work on the instant; and if there had been no one in the office but himself would very probably have—whistled!

#### CHAPTER XXVI.—REGRETS.

“The friends thou hast, and their adoption tried,  
Grapple them to thy soul with hooks of steel.”  
—*Shakespeare*.

Mr. GOLDIE had indeed many troubles to bear at this moment, and not the least of them was that there was no one about him whom he could take into his confidence and make a partaker of his cares. Mr. Huxtable was a new man; he was so fussy and attentive, so much so that Mr. Goldie sometimes felt inclined to resent his familiarity. The old man had been accustomed to manage his own business; but latterly Mr. Peterson had done the greater part of his work for him without his being aware of it. The late manager's advice had not often been asked for, but he had contrived to offer it with so much consideration and tact as to make it acceptable, and the results when fortunate had been attributed by Mr. Goldie to his own sagacity. In Mr. Peterson's time, too, when the master gave his instructions they were understood at once, and acted upon, not only with punctuality, but with so much judgment and discrimination as to render any appeal for further directions under altered or unexpected circumstances unnecessary. In short, while Mr. Goldie sat at his

table, chief of the establishment, and took credit to himself for everything that was done in it, Mr. Peterson had been in reality, of late years, the principal agent in the whole business.

The old merchant had begun to find this out now, in a very practical and disagreeable manner. Mr. Huxtable managed things very well, but he had not the same regard for his master's credit and susceptibilities. He took things too much into his own hands, and seemed to wish it to be known and felt that he was all-important. He opened letters and answered them without consulting Mr. Goldie; he intercepted clients who asked for the principal; and, in short, seemed inclined, as much as possible, to make a cypher of him. Mr. Goldie did not object to have his work done for him, but it annoyed him to feel that it was thus taken out of his hands, as if he were of no account. But Mr. Huxtable always excused himself as doing it to save Mr. Goldie trouble; and as things generally turned out pretty well, the latter could only protest and submit.

Another thing that grieved him was the loss of his clerks and the bringing-in of strangers in their room. He had not cared so much about one or two younger ones, who were the first to leave; he hardly knew them, and Mr. Huxtable had given plausible reasons for their dismissal. Two seniors had given notice, and had gone away on their own account. Mr. Goldie did not see how he could have prevented that. He never proposed to a clerk or a servant to remain when they had once talked of leaving; that was an axiom of the establishment. But when it came to Jones—old Jones—whose head was as bald as his own, and had become so in his service, who had sat upon the same stool in the same corner of the counting-house, at the same great desk, as long as he himself had sat in the room above him, Mr. Goldie was stirred. The old book-keeper had shown signs of emotion, too; he was not a mere piece of office furniture—a venerable writing instrument, but a man of kindly feelings, and capable of warm attachments. Mr. Goldie had felt himself drawn towards him that day; he and Jones were, in a business sense, the last of their generation. If Jones were to leave he would be all alone with Huxtable. His indignation was aroused against Huxtable, and in proportion as he disliked Huxtable he loved old Jones.

A still heavier anxiety tormented the old man at this time. The *Daphne* had been several months out, and lately nothing had been heard of her; she had spoken two or three ships in the earlier part of her voyage, and it was known that she had encountered rough weather and had made slow progress, but she ought to have been heard of by this time; she ought, indeed, to have arrived at her destination and to have notified the fact by telegram. Inquiries had been made, but nothing could be ascertained as to her whereabouts. She had a valuable cargo, but he did not think so much about that; it was the thought of young Charles Peterson that grieved him most. Day after day he met his brother John upon the stairs, or saw him in the counting-house, and understood his grave and anxious look, and could only shake his head and say, “No news yet, but nothing to be afraid about.” It was no use stopping to speak to him, for John Peterson knew before anybody else what was written in the great books at *Lloyd's*, and what was wanting. Mr. Goldie had lost a ship before now at sea, and

had heard the wailings and complaints and reproaches ever of those whose sons or husbands had been drowned, but he could not bear to think that such a fate had befallen the passengers and crew of the Daphne. It had lain upon his conscience for some time past that he had done wrong in sending Charles Peterson away, and he knew too well that he had been influenced by personal motives. His feelings towards his late manager had become changed under his recent experiences, and he confessed to himself that he had not done him justice while he was alive, nor acted with proper consideration for his children after his death. If Charley could have been recalled he would have been sent for long ago, and one of those vacant places in the clerks' office given to him. If now he should be lost, how could he ever answer it to his conscience? What could he say to the poor mother whose life seemed to be wrapped up in that of her son? It had been a cruel thing to take him from her care and to send him so far away from home. He had not intended it in the first instance, and it was his elder brother who had decided it by choosing the home appointment for himself. But then it was Mr. Goldie who had insisted upon it at the last, and it was he who had changed the destination for one more remote, and that for reasons of his own. They were sufficient reasons, he argued with himself—at least, he had thought so at the time, and his opinion had been confirmed since. His daughter Amy was evidently more deeply attached to the young man than any of them had supposed; she had not been like the same girl since he went away; and though, of course, Charles Peterson's name was never uttered at home in her presence, they knew very well what it was that she was looking for in the newspaper furtively whenever they happened to surprise her with it in her hand; they could tell by her hurried manner at such times how eagerly she desired to gain some tidings of the ship in which Charley had sailed. She was listless and absent too, and had lost the bloom upon her cheek, and was altogether changed.

Mrs. Goldie knew how matters stood, and had talked with her husband about it; and they had both agreed that though it was "too absurd," it was a good thing the young man had been sent away so soon. Amy had since come out, and it was to be hoped she would soon get over her fancy; and as for the young man, of course he would not think any more of her; if, indeed, he had ever thought of her at all, which they hardly deemed probable.

But when week after week passed by, and no tidings of the ship came home, then other thoughts prevailed. Then Mr. Goldie could not drive from his mind the memory of his old faithful clerk, whose life had been lost in his service. He recollects the appeal which Mr. Peterson had made to him at their last interview, and could not but acknowledge that he had not been properly valued or remunerated, and that it was in consequence of this that the widow had been left without a proper provision.

Yes; he felt it now. Peterson had been a valuable and faithful servant, a true and devoted friend. And he, Goldie Brothers, had requited him but poorly during his lifetime, and still more unworthily after death. Oh, if they could but have some tidings of the ship! If they could but hear that the poor boy was safe and well! Mr. Goldie was getting into years now, and found the burden of his daily work,

with its new cares and complications, and with a Huxtable instead of a Peterson, too much for him. He might not be able to go on with it much longer. He would like to make some reparation to the widow for the wrong which he had done. He would like to deliver his own conscience from the remorse which tortured it. But if it should turn out that the ship was lost, and that Charles Peterson was drowned, as his father had been, by his act and in his service, he thought that he should never enjoy peace or happiness again.

Mr. Goldie sat in his arm-chair, at his table, holding in his hand the pen which he had taken up mechanically when Mr. Jones quitted the room, thinking and pondering thus, and drawing straight strokes upon his blotting-pad, unconscious how the time was passing, until long after the usual hour for closing the office. The young clerks had already put away their work and taken their departure. Mr. Huxtable had gone out early on business and was not expected to return. Only Mr. Jones remained, his books carefully put away and his safe locked, waiting for his chief, and wondering why he did not come. At length his step was heard upon the stairs; Mr. Jones sat still, for he had resolved not in any way to presume upon the friendly confidences which had passed between them that day, but to maintain the same distance outwardly as before; unless Mr. Goldie should make the first advances. Mr. Goldie passed the office door and was going out of the house, but stopped and returned.

"I am afraid I have kept you waiting, Jones," he said, looking in.

"Not at all, sir," Mr. Jones replied, getting up briskly from his seat; "no consequence at all, Mr. Goldie."

Mr. Jones was struck with the sad and depressed look of the old merchant, as he stood opposite to him. He thought his face had grown thinner and longer since the morning, and he did not look straight before him as his manner was, but drooped his eyes and eyelids towards the floor.

"Aren't you well, sir?" Mr. Jones asked, looking at him with much concern.

"Yes, thank you, Jones. Oh, yes; I'm very well. Good evening, Mr. Jones; it's going to be fine, I think. Good evening, Jones."

Mr. Jones returned his greeting heartily, and the merchant went away. The old book-keeper lingered a few minutes that he might not seem to be intrusive, and then followed him.

When he got into the court he saw Mr. Goldie standing in the archway talking to an old woman, and thrusting his hand into his pocket as if he were about to give her some relief. It was so entirely opposed to his custom to give anything to a beggar that Mr. Jones felt much surprised, and perhaps a little sorry. It was a pity, he thought, that Mr. Goldie should give way in that fashion. It was all very well and very pleasant that his manner towards himself should be softened, but it showed weakness of character to depart from his principles and to lend a willing ear to everybody who might address him. The poor woman, however, seemed to reject Mr. Goldie's offer of money.

"It's not that, sir," Mr. Jones heard her say; "if you could but give me good tidings of the Daphne, it would be better to me than all the gold and silver in the world. My son is aboard the Daphne, my only son, too; and I'm a widow this many years,

and if it was not for what Jack gives me I should have gone to the parish long ago. He's been a good son to me ever since I lost my poor man, who was drowned in one of your ships, Mr. Goldie, as you know yourself. And now I'm getting frightened about Jack. Have you heard any tidings, sir? Tell me true, I beg and pray, sir."

"I am very sorry," Mr. Goldie answered, "very sorry, indeed; but I can't give you any information yet. I expect to hear every day."

"He's my only son, sir," the poor woman pleaded, as if she liked to cherish the belief that it was in Mr. Goldie's power to help her. "And a good son, too. When shall we hear something?"

"My good woman," said Mr. Jones, anxious to relieve his chief of what he felt was an unpleasant interview—"my good woman, we are as anxious about the *Daphne* as you can be."

"Anxious! Are you, though? Are you anxious about her? I thought so; I was afeard so. I have been up to the counting-house before to ask, but they told me there was nought to be afeard on. Oh, what shall I do? Oh, Jack, my lad, shan't I never see your face again?"

"Don't be alarmed," said Mr. Goldie, kindly; "Mr. Jones did not mean to say that we were really anxious. We shall be sure to hear of the ship soon. No news is good news; don't be troubled without a cause."

"Oh, Mr. Goldie, can't nothing be done to find out?" the poor widow exclaimed. "Salter my name is; I'm Jack Salter's mother. Mr. Peterson knew me; he used to send me word when any news came

in; now I don't know anything of what goes on. Can't you send a telegraph or something?"

"Leave her to me, sir," said Mr. Jones, seeing how the poor woman stood in Mr. Goldie's way, and held him by the arm in her eagerness; "I'll see to her," but Mr. Goldie did not seem at all impatient. He talked to Mrs. Salter as cheerfully as he could about the ship, and questioned her about her son, and suffered her to think that he knew him and remembered him personally, as well as by name, and promised to send her news of him—good news, he hoped—by special messenger as soon as it arrived. And so he quieted her fears, and sent her away with a tear in her eye and a sovereign in her hand, comforted in more ways than one.

His own eyes were moist as he looked after her, and thought how many wives and mothers were tortured, perhaps, with similar anxieties, waiting in their humble dwellings for tidings of the men and boys who were away at sea in his service, and wishing that he could send them good news and golden consolations with it, one and all. He had not thought enough about them hitherto.

"I wish—" he said to Mr. Jones; but stopped there.

"Yes?" said the other, inquiringly.

"I'll speak to you about it another time," he said. "It was only an idea about these people. I shall think it over. If we could but hear good news of the *Daphne*, I should be so glad for their sakes, as well as for others."

He took Mr. Jones's arm and walked with him to the end of the street (as if they had been brothers, Mr. Jones said afterwards), and there they parted.

#### ROBERT WERE FOX, F.R.S.

BYRON, in his cynical way, said of Falmouth that it contained "many Quakers and salt fish." The salt fish apart, that which was true of Falmouth twenty years since was true two centuries ago, and is equally true now, for Falmouth was one of the places in which the principles of the early Friends took the deepest root, and Falmouth, in proportion to its population, has more members of the society now than any other town in the west of England. Even so far back as the time when sturdy George Fox was imprisoned in the noisome den at Launceston Castle, still pointed out, and still occasionally called by its old name of "The Fox's Hole," Quakerism at the then infant town of Falmouth was gathering strength; and Charles II had not long been seated on the throne before the state papers record that the Falmouth Quakers were "grown so impudent that they were actually building a house to meet in, and this although many of their brethren had been sent to the county gaol for daring to assemble for worship."

The Fox family has for two centuries been prominent among the Friends of Cornwall, and many of its members still reside at Falmouth, which owes much, indeed, to them and to their predecessors. Though the surname is the same, the Cornish Foxes are in no way connected with the family of the apostle of Quakerism, but descended from one Francis Fox, who settled at St. Germans, in Cornwall, in the time of the Protectorate, and who is the ancestor not only of the Foxes of Falmouth, but of those of

Plymouth and Exeter, and of other places in the west of England.

Prevented by the Test Act and other intolerant statutes from taking any part in public affairs, the Cornish Foxes engaged in mercantile enterprise, and speedily built up a wide-spread and well-earned reputation for business acumen and integrity—an integrity never more clearly shown than when Joseph Fox in 1785 returned to the French owners his share of the proceeds of certain prizes which had, through incidental business relationships, fallen into his hands during the war.

Such was the stock of which came Robert Were Fox, F.R.S., born at Falmouth on the 26th of April, 1789, and dying there, full of years and honours, the same simple, earnest, kindly Christian he had lived, on the 25th July, 1877. His was a singular, and in many respects a striking, though unpretending career. And his life affords a fine illustration of the unity of all true, honest spirit and endeavour, of the perfect compatibility of characters—now, alas! often dissociated—the characters of a humble-minded and devout Christian, an energetic and successful man of business, a skilful and fearless man of science, an ardent and self-sacrificing philanthropist.

The exclusion of the Nonconformists from the advantages of University education, while throwing him upon his own resources for mental culture, tended somewhat to turn his attention to scientific

inquiry. The fact that his family were in his youth largely interested in the mining operations which form the special industry of the county of Cornwall, gave his scientific speculations a bias in the direction in which he afterwards achieved his well-earned reputation. Not a single branch of science connected with the conduct of mining enterprise escaped his inquiring spirit. Mechanics, chemistry, electricity, magnetism, light, heat, and mineralogy, all had their turn—or, rather, were all pursued together in their speculative as well as their practical relations, with a zeal and with a patient power of analytic research that made them yield up many a secret to the young investigator.

For it must be remembered that several of these sciences were then in their infancy. And mining, although it had been practised in the rocky peninsula from times beyond the date of recorded history, was then very different from what he lived to see it. True, the atmospheric engine of Newcomen had given place to the low-pressure engine of Watt and the high-pressure engine of Watt's great Cornish rival Trevithick, the inventor of the locomotive and many another ingenious form of mechanism which other men carried to a more successful issue, and of which they obtained the credit. True, the great county adit which drains the mines of Gwennap, Redruth, and Illogan to this day, and which with its ramifications extends over a length of thirty miles, had been formed. But there were few mines then the depth of which reached 100 fathoms, or 600 feet, whereas the depth of 350 fathoms, or 2,100 feet, is now exceeded, as at Dolcoath. Moreover, in the dressing of the ores, or their preparation for market, hardly any improvement of consequence had been made for centuries. Science in its broad sense was indeed not applied to mining at all, but everything was carried on in traditional fashion, based upon traditional axioms, embodying the results of ages of accumulated experience, beyond the confines of which there was very little inclination to go.

Robert Were Fox was not twenty-three years of age when he made his first important discovery. He had been investigating in conjunction with a friend, Joel Lean, a name honourably distinguished in connection with mining research, the properties of steam, and he succeeded in proving that the advantage of the use of high-pressure steam was not chemical, but mechanical. This was rapidly followed by a series of investigations into the important question of subterranean temperature. Up to that time, 1815, nothing certain was known upon this. The mines of Cornwall afforded unequalled opportunities for the investigation; and Mr. Fox's connection with mining enabled him to turn these opportunities to account. For years the observations were continued, until, indeed, he had succeeded in establishing the fact of the gradual increase of temperature of the earth in depth. His experiments were questioned and his conclusions denied. Even such a man as Arago long declined to accept them. And where the fact of the increase of temperature in depth was admitted it was ascribed to accidental, and not to natural—to industrial, and not to cosmic causes. But now there is no conclusion of science more firmly established. An important series of tables bearing upon this subject will be found in the writings of another eminent Cornishman, the late William Jory Henwood, F.R.S., who began life as a clerk in the establishment of the Messrs. Fox, at Perran Wharf. He owed his

first start in science to the subject of this paper, who recognised the singular power of exact observation in matters scientific that made Mr. Henwood the leading authority on the subject of metalliferous deposits.

These observations on subterranean temperature led Mr. Fox to the researches which are most closely associated with his name. The mineral lodes of Cornwall and Devon, and elsewhere—using the term lode as distinctive from mere deposits—are fissures in the rocks which have been subsequently filled by various mineral substances, it may be earthy, or it may be metalliferous. Attention has long been directed to the investigation of the occurrence and origin of these mineral veins. It was comparatively easy to prove that the lodes were not contemporaneous with the enclosing rocks, but there has been much controversy concerning the manner in which the minerals were deposited in them. Heat is now admitted to have had an important share in the work, and the currently accepted hypothesis is that heated vapours and waters, charged with the various mineral substances, rising from the interior of the earth through the fissures, have been the chief, if not the only, agents. Mr. Fox, the pioneer of this view, fifty years ago proved that electricity was an important factor. He formed the hypothesis that in the earth there existed the conditions of a voltaic pile, giving rise to electrical currents; and on descending some of the deepest mines he had the satisfaction of seeing his view proved correct by the deflection of the needle of the galvanometer when the wires were connected with different parts of a vein. Nor did he stop here. In a series of very beautiful experiments he so far succeeded by electrical action in reproducing natural phenomenon as to form mineral veins in clay, and to resolve and reproduce divers mineral substances.

We find other instances of the acuteness and versatility of his scientific powers in his construction of the deflector, or dipping-needle, by which magnetic dip and intensity have since been measured. It was not in idle compliment that the needles which were taken by the late Arctic expedition were not merely made under his direction, but were sent to Falmouth to receive their final adjustment from his own aged hands. In telegraphy he discovered, independently of Steinheil, the important fact that with one wire only the circuit is completed through the earth. Well had he earned the honour which in 1848 was conferred upon him—his election to the Fellowship of the Royal Society.

We might dilate much more upon his scientific work, upon the share he had in establishing the Royal Cornwall Polytechnic Society, which is the parent of all the industrial exhibitions of 1851 and later days—the germ whence their idea was first developed, and which was really originated by one very near and dear to him, Miss Anna Maria Fox. But enough has been said of this side of his character. Turn we to another of its phases. He was as active in philanthropic work as he was in scientific. That liberty and freedom which in the old Quaker spirit he claimed for himself, he sought to obtain for all. Wherever men suffered, his hand was ready to help. He worked alike to strike off the chains of the slave, to remove the civil disabilities of the Roman Catholic and the Jew, to rescue men from the worse tyranny of sin and evil habit by pointing them to the saving health of the gospel, whose profession he adorned. He visited Lisbon, in 1852, to present to the Queen of Portugal an address on the subject of

slavery. He went to Madrid, in 1863, to plead with Isabella for the liberation of the poor Protestants, Matamoras and his companions. And he was thorough. Never did he neglect one duty for the sake of another. "Neither commercial nor philanthropic engagements, no scientific pursuits or social pleasures, were allowed to interfere with regular attendance at the meetings of the Society of Friends." To him there was neither great nor small when the path of duty was clear. For nearly threescore years and ten he was an active supporter of a British School. For more than sixty years he laboured on behalf of the British and Foreign Bible Society. He found time, amid his manifold engagements, to act as guardian of the poor, and to give special heed to the training of that much-neglected class, the workhouse girls. Whatsoever his hand found to do, he did with all his might. His earnest, simple, duty-doing, beneficent Christian life, is a lesson which many in these days would do well to ponder. To few men has it been given to show more clearly how possible it is to make the best of both worlds, if only God's way be taken—the way of integrity and simplicity and earnestness and love.

The distinguished scientist, the ardent philanthropist, the active man of business, the representative of foreign States, known and honoured in

almost every part of the civilised world,\* was throughout the humble-minded—aye, and old-fashioned—Quaker, who thought nothing so dear as the simple Christian faith, which he at least found not inconsistent with the highest intellectual culture, the most active concern in the general business of life.

He had his trials, not least the death, in his prime, of his only son, far away in a foreign land. But he felt that God knew best, and murmured not at the Divine will. Early rising, temperate living, a cheerful and contented mind, made even fourscore years no labour and sorrow to him. The closing period of his life was spent in that lovely domain at Pengerrick, near Falmouth, where rare foreign trees and shrubs grow in the rich luxuriance of their native climes, and where the stranger has ever found a welcome. Surrounded by a large circle of relatives and friends, visited by distinguished men from all parts of the world, the evening of his day passed peacefully and pleasantly to its patriarchal close—his mind undimmed to the last, his heart warm as ever, his sympathy never failing. A good man, true to his day, his generation, and himself, was lost to earth when, in his eighty-ninth year, Robert Were Fox drew his last breath.

\* Among his consulships was that of the United States, to which his father had been appointed by Washington.

#### FAIR ISLE.

MIDWAY between the Orkney and Shetland group of islands, about twenty-five miles from the nearest point of each, there is a lonely sea-girt rock known as the Fair Isle. It is between two and three miles in length by half a mile in breadth. Formed of the Old Red Sandstone, which the writings of Hugh Miller have made us familiar with in the north of Scotland, the island presents bold precipitous cliffs and headlands, battered into fantastic shapes, and worn in many places into caves by the wild waves of the Atlantic.

In the old times of the Norsemen Fair Isle was an important signal-station, the watch-fire on a lofty height, still called Ward Hill, being visible from the nearest islands. There is a legend that when Earl Paul ruled over Orkney and Shetland, in the twelfth century, Earl Ronald made an invasion, and succeeded, through first having bribed the warden's servant to damp the wood ready for the beacon fire. The invader's fleet was thus enabled to land in Westra, in the Orkneys, without resistance.

A more interesting and authentic historical association is the wreck upon Fair Isle of Don Juan Gomez di Medina, commander of one of the divisions of the Spanish Armada, in his ship the Gran Grifon. It has usually been stated that the commander-in-chief, the Duke di Medina Sidonia, with his ship the Santa Trinidad, was here wrecked, but the mistake has arisen from the similarity of the name.

The following is Sir Robert Sibbald's account of the wreck:—"The Duke of Medina, admiral of the Spanish Armada (in the days of Queen Elizabeth), suffered shipwreck in a creek on the east side of the isle, where the ship split, but the duke and two hundred of his men came to shore alive and wintered here in great misery, for the Spaniards, eating up all they could find, not only neat (cattle), sheep, fishes, and fowls, but also horses, the islanders in the

night carried off the beasts and victuals to places in the island where the Spaniards might not find them. The officers also strictly commanded the soldiers to take nothing but what they paid for, which they did very largely, so that the people were not great



losers, they having got a great many Spanish ryalls for the food they gave them. But now the islanders, fearing a famine among themselves, kept up the

vituals from the Spaniards. Thus all supplies from the isle failing them, they took their own bread, which they had preserved, which being dipped in fish oyl they did eat, which being also spent, it came to pass that many of them died from hunger, and the rest were so weak that one or two of the islanders, finding a few of them together, did cruelly throw them over the rocks, by which means many more died. At length all sustenance failing, not only to the Spaniards but also to the islanders, they sent a small boat, or yole, to Zetland, desiring a ship to carry them out, lest all the inhabitants of the isle should be famished.

"Notice came to Andrew Umphrey, of Burry (then



WRECK AT THE SHELDIE CLIFFS.

proprietaire of the isle), who, having a ship of his own, instantly went to the isle and brought them to Zetland, where, for the space of twenty days or a moneth, they met with better entertainment. The duke staid at Querndale, where he was hospitably treated by Malcolm Sinclair, laird of the place. From Zetland Andrew Umphrey carried the Spaniards in his little ship to Dunkirk, for which the duke rewarded him with 3,000 marks."

The ship which took the admiral and his crew to Dunkirk touched at Anstruther, in Fifeshire, of which parish James Melville (nephew of the more famous Andrew Melville, upon whose shoulders the mantle of John Knox fell) was minister. James Melville's Diary is well known in historical literature, and in it he gives a graphic account of the arrival of Don Juan Gomez and his Spaniards. He describes the admiral as "a very reverend man, of big stature and grave countenance, grey haired, and very humble-like, who after much and very low courtesy, bowing down with his face near the ground, and touching my shoe with his hand, began his harangue in the Spanish tongue." In short, he behaved like a noble Spanish gentleman, adding to his demeanour the respect paid by laymen to ecclesiastics, as he doubtless perceived Melville to be the spiritual grandee of the little seaport. It is altogether a strange peep into the age of Queen Elizabeth and of the Scottish James vi.

Other shipwrecks of more recent times have kept

Fair Isle in public remembrance. On May 23, 1868, an emigrant ship, the *Lessing*, from Bremen to New York, with twenty sailors and 445 passengers, was wrecked at Sheldie Cliff. A dense fog prevented the officers from taking observations, and imagining they had long since passed the Fair Isle, every sail was set to catch the breeze, and the ship was going at the rate of seven knots an hour when at daybreak she struck with a crash which aroused the poor emigrants, most of whom were in their berths asleep. Immediately afterwards the sea rushed in, and those on the lower deck had to hasten above to save themselves from drowning. The islanders came promptly to the rescue of the unfortunate passengers. As the ship was unapproachable from the sea, they took their little boats into a singular cavern, called the Sheldie Cave, which passed through the rocks and opened into the creek where the ship lay. The boats being laden with men, women, and children, the islanders had to watch for an interval in the waves to pass through the cavern, else their frail barks would have been swamped by the tide as it dashed against its sides. Then proceeding onwards to a part of the rock that was not so jagged, the whole party were drawn up the face of the cliff and landed in safety on the summit. The children made the ascent tied on men's backs. Intelligence of the disaster having reached Lerwick, a schooner was immediately provisioned and despatched to the island. In the course of three trips the crew and passengers were conveyed to Lerwick, where part of the court-house and prison, and two apartments in the fort and some store-houses, were made ready for their reception.

A young lady who passed the summer of 1868 in Shetland told the writer that it was truly touching to see the gratitude evinced by those poor Germans towards their benefactors, and that she never listened with such pleasure to Mendelssohn's music as when rendered at two open-air concerts by a portion of those rescued from the ill-fated *Lessing*.

For the space of several weeks in the summer of 1876, fire signals were seen at night on Fair Isle, both by passing ships and people living near Sumburgh Head. The mail steamer *St. Clair*, on its way to Shetland, was near enough for the crew to perceive two groups of people—one consisting of twelve men—waving and making frantic signals, but in consequence of the heavy sea it was impossible to approach the island. It was feared that a wreck must have taken place some time before, and that if many people were saved, there would consequently be a scarcity of provisions. The news being telegraphed to Lerwick caused much anxious curiosity. On Monday, June 15th, the weather proving favourable, and the signals of distress being still shown at the Fair Island, the *St. Clair* sailed in shore, when a boat came off from land and reached the ship. Happily, there was no scarcity of food, but only some shipwrecked mariners who were impatient to get off. The crew, seven in number, were brought on board with great difficulty, some of them having to be pulled by ropes through the surf. It was found that the wrecked ship was a German brig, the captain of which, when the vessel struck on the island, jumped from it, lost his footing, and was drowned. The mate reported that during a late storm two other vessels had struck on the island and went to pieces, but though there was a great amount of wreckage on shore no clue could be obtained either to the ill-fated ships or their crews.

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The most recent wreck on the Fair Isle was that of the screw steamer *Duncan*, of Dundee, while on a voyage from Dundee to Archangel. This vessel, overtaken by a heavy fog, struck about eight o'clock on the morning of Thursday, 18th July, 1877, on a ledge of rock at the south end of the island. All efforts to get her off proved unavailing, and in a short time she filled and sank. Fortunately there was a calm sea, so that the crew, thirteen in number,

As yet no lighthouse has been erected, and no minute-gun or fog-bell bids the tempest-tossed mariner beware of this treacherous shore. An application has, we believe, been made to the Government for a mail, a lighthouse, and life-saving apparatus for the island. The catastrophes of the last winter and summer are sufficient of themselves to show the necessity there is for these means being adopted for the preservation of life and property.



WRECK OF ONE OF THE SHIPS OF THE SPANISH ARMADA.

and a solitary passenger, the Rev. Mr. Watt, got safely to land in the ship's boats. The mail steamer *St. Magnus*, which called at the Fair Isle, took the shipwrecked seamen on board, and landed them at Lerwick on Saturday night. The *Duncan* was the third vessel that during eight months had been lost on this dangerous coast.

Although many wrecks which have taken place here have been seen, and the names and destinations of the ships ascertained, many more are believed to happen which are never discovered, as owing to the velocity of the tide and the depth of the water every trace of the disaster is swept away in a very brief space.

In spite of the privations they endure, and their isolated life, the Fair Islanders are esteemed an ingenious, hard-working, and intelligent race of people. Their thirst for information is immense; every scrap of paper is read with avidity; and so anxious are they to know what is going on in the world, that in summer, should the weather prove favourable, they go out in their boats to meet the Shetland steamers and beg for newspapers. A recent writer thus describes an incident which occurred while passing the island:—

“The steamer's course was dotted over with ten or twelve little boats which seemed in a fair way of

being either run down by the steamer or swamped by the wash of her paddles. The boatmen have evidently no such fear, for instead of avoiding the apparent danger they pull close up; amid the roar and rush of the steamer, which has not slackened speed, they are heard addressing the passengers hurriedly but eagerly, 'Throw a paper, throw a paper.' Such an appeal is of course irresistible to any man with a newspaper in his pocket and a particle of kindness in his disposition, and the poor Fair Isle boatmen get the benefit of both.

"Dozens of papers may be thrown overboard, but every one of them is picked up. The plunge made by the little sharp-pointed boats into the rough waters in the wake of the steamer seems perilous in the extreme, and resembles nothing so much as the bobbing up and down of ducks in a very stormy pond; but the capabilities of the boats and the skill of the rowers are well known and have been tried in many a wild water.

"This little incident causes quite a commotion on board, and those of the passengers to whom it is new are very much interested by it, and receive, I have no doubt, a livelier impression of the loneliness and isolation of that almost unvisited island than anything else could give them."

A deputation who visited Fair Isle not very long ago were persuaded, on occasion of their distributing books, "either that there must be a great many towns in the island, or that several of the inhabitants had asked for them twice."

The islanders have a great dread of fevers and other infectious diseases, and they seldom ventured on shore when they visited Kirkwall and Lerwick without first asking, "Is the fever in town?" "Any cases of small-pox?" "Any people dying?" They are said to be warmly attached to their rock-bound home and to each other, and so closely connected by intermarriages that they may be regarded as forming one large family.

Most of the men have at one time or other visited Shetland, but few of the women have ever been beyond their native rock. The type of the inhabitants is generally what is known as Scandinavian, and the prevalent colour of hair is a lightish-brown or yellow. The women for the most part look thin and overworked. They are celebrated for their skill in making their peculiar coloured hosiery—the wool tinged by native dyes, chiefly lichens. The men are equally so for the ingenuity with which they construct their canoe-shaped skiffs, which have all the buoyancy of lifeboats, and which run little risk of being swamped in the stormy seas. These skiffs are rowed or paddled with great dexterity by the islanders themselves, but are very unsafe in the hands even of skilful boatmen who are unacquainted with their management.

The dwelling-houses are, for the greater part, of a very wretched description. They have the byre and the dwelling under one roof, and a door common to both. Being without windows, they are necessarily very dark. A small table, one or two chairs, or a substitute in the shape of an inverted cask or peat-creel, and a large cupboard or chest of drawers, with an abundant supply of trunks for family and household purposes, form the principal articles of furniture. The fire is in the centre of the floor. Overhead the rafters are covered with fishes of various kinds, which are being "cured" by the smoke. A pig is generally to be found by the side of the glow-

ing peats, or it may be a dog or cat; in some cases a calf. And should a hen with her brood of chickens not be walking about, they will be found in the *keyshie* which hangs upon the wall. The sides of the passage leading to the best room of the dwelling are lined with box-beds; these form the partitions between the two apartments. Families who are able to afford it keep a couple of ponies for carrying the peats. Sad to relate, owing to the dearth of fodder for them in the winter, these poor creatures become so miserably thin and weak that when impelled by hunger to climb to dangerous points of the cliff in search of food they are apt to be blown into the sea. Every year sheep and ponies are lost in this way.

The island is chiefly valuable as fishing-station. The fish caught in greatest abundance is saith, or coal-fish. The greater part of the land is unclaimed and unreclaimable. Some portions of the soil yield oats, bere, and potatoes; but although sometimes tolerable crops are raised, from the exposed situation these are liable at all times to be soaked by the sea spray.

As ascertained by the Commission appointed in 1872 to inquire into the truck system in Shetland, the population of the Fair Isle was, in 1861, 380. Soon after that date, in consequence of over-population and a season of great scarcity, 100 of the people emigrated to America. At other times, too, emigration has taken place. One of the witnesses examined by the Commission stated, for example, that six families went to Kirkwall to reside in 1869, because meal was so dear and wages were so low.

At all times, says the Report, emigration must have been necessary to prevent intolerable over-crowding in so small an area, and yet the whole circumstances of the island show that the remedy is resorted to with great reluctance. In 1872, according to the same authority, the inhabitants numbered 226, forming about forty families. At the time of my visit the number was 185.

"On the 1st August," we quote from a letter in the "Shetland Times" of August, 1877, "a party of six gentlemen, including three United Presbyterian clergymen from different parts of Scotland, and one lawyer from Edinburgh, visited Fair Isle. After some hunting about, quarters were secured for four of the party in the house of John Wilson, known as 'the factor.' The other two were lodged for a night with Lawrence Irving, and left next day for Lerwick by the packet Columbine. The four remained till Saturday. During their stay on the island they had many interesting experiences, among others the following. A tea-meeting was held in the schoolroom. There were about 160 persons present. The tea was generously supplied by Mr. Bruce, the proprietor of the island." The letter also says that "a marriage was performed, the bride being sister to the bridegroom's deceased wife. The banns had been published, and no objections offered; but the loving couple, who had gone to Kirkwall to be united, had been sent home by the clergyman there with the knot untied, and utterly disconsolate. The bridegroom is evidently a superior man, although only a Fair Isle fisherman—fine-hearted and intelligent. He received one of the medals presented by the Board of Trade for gallantry in saving life." A religious service, attended by almost all the islanders, was held in the schoolroom on the following day, Sunday, at the close of which a child was baptized to John Wilson. All the gentlemen of

the party were much pleased to witness the happy relations existing between the proprietor and the islanders. The unanimous testimony of the islanders was that they had never been so well off under any previous landlord.

The following extracts, taken from a letter which appeared in the "Edinburgh Courant," Friday, August 3rd, 1877, will, we imagine, also prove interesting to our readers. It is from Mr. Watt, the only passenger on board the *Duncan* when she was wrecked on the island.

"The whole island is owned by one landlord, who bought it not many years ago, but I should not think it has proved a profitable speculation. He keeps a portion of the island in his own hands, and farms it by a factor or agent sent there from Shetland. The crops of oats and bere were very promising, and there are also the beginnings of a pony farm, which ought to succeed. To every cottage there are attached a few acres of land cultivated by the women, and on these the potato crops looked very well. The landlord is said to be most anxious to encourage his tenants to make improvements, but I fear they are not enterprising in this respect, and, with one or two exceptions, the dwelling-houses are of a very sorry description. The only fuel used is peat, brought at great expense of trouble and time from a remote part of the island. It seems the turf is not far from being exhausted, and the loss of it entirely may turn out to be gain to the people, for coals can be brought by sea to them at a very reasonable cost, and the use of coal may suggest a less primitive mode of getting quit of their household smoke. The landlord has a monopoly of supplying his tenants with the various articles which they require, and also of purchasing their fish and surplus stock fed on the common ground. There appear to be no complaints on the score of fair dealing here, and, indeed, no other way of maintaining correspondence with the mercantile world is at present practicable. There are twelve boats on the island, and the fishing that is found most profitable is that for *saithes*. The fishing ground is only about a mile off the island. Large quantities are brought ashore daily, and salted for the Irish market, while cod-liver oil is manufactured from these fish on the shore. Hospitality is exercised very freely. After our crew's work was ended about the wreck, the people, as a matter of course, arranged what families could accommodate the men singly or in couples, according to circumstances. No desire was manifested to make gain out of the unfortunate, nor was any fee asked in return for personal services rendered. Yet, as being people of saving habits, who have been to some extent spoiled by being made objects of charity, I doubt if they would have strength of mind to refuse in any circumstances a gift offered to them.

"I am strongly of opinion that it is a mistake to send to this island the usual donations made to the poor—blankets, clothes, oatmeal, etc.; these can readily be procured by the islanders themselves. Those who wish to be kind to them might properly send books, medicines, or those little luxuries that the sick and aged can partake of. As to the right person to be entrusted with any gifts for the good of the island, there can be at the present time no doubt. The Society for Propagating Christian Knowledge has been very fortunate in the choice they have made of their missionary-schoolmaster, Mr. Lawrence. My own opinion of his qualifications was formed by

three days' constant intercourse with him, and I was glad to find it confirmed in Shetland by men of the highest position there who have known him for years. An elder of the church, he has a recognised ecclesiastical position; a successful teacher in Shetland for many years, he has earned high praise from the inspectors at the Fair Isle; holding a mate's certificate, he is an unquestionable authority on nautical affairs; qualified to dispense medicine, set broken bones, and extract teeth, no wonder that the islanders should, as one of the women expressed it to me, 'love him like a brother.' The school is thin at present, as the great gathering is going on, and our unexpected arrival stopped all regular work; but I examined the few pupils present, and there was no mistake about the efficiency of the instruction. On Sundays the people meet in the church for service, and a well-selected sermon is read to them.

"The only form of dissent known on the island is Methodism. The inhabitants are about evenly divided between the Church of Scotland and that form of religion. I did not learn the precise time at which this last appeared on the island, but I gathered from gravestones in the little churchyard that there were 'class leaders' fifty years ago. There is a small Methodist chapel, and the division in religious matters seems in past times to have been the occasions of some disputes. The large emigration from the island seems to have been greatly connected with this. Now, however, owing mainly, I believe, to the prudence of Mr. Lawrence, there is very pleasing



ROCK TUNNEL IN THE SHELDIE CAVE.

harmony on the island. My visit to the island became the occasion of proving this in a very unexpected way. Immediately on landing I became an object of interest as being the first *minister* that had ever been wrecked on the isle. The parish minister, who lives at Dunness, in Shetland, visits the isle regularly, and dispenses church ordinances. But the Methodists had, as a rule, refrained from availing themselves of his services to have their children bap-

tized, in the hope that a minister of their own persuasion would appear. Four years having elapsed without bringing one, they approached me on the subject. As a matter of course, I referred them to their own missionary, Mr. Lawrence, and said that, after satisfying him, I should have no difficulty about dispensing the ordinance in the parish church. Accordingly, on the afternoon of the Saturday on which we left, the boats returned earlier than usual from sea, and over a hundred of the inhabitants met along with my shipwrecked crew in the parish church. The service altogether was the most interesting it has ever fallen to my lot to conduct. There was good reason for this common thanksgiving from myself and companions, and the desire to have the service was spontaneous on the part of the latter. Then, after sermon, there were a few words of acknowledgment to be said to the kind-hearted islanders. Eight children were presented for baptism from six Methodist families, and as we left the church our look-out announced that the smoke of the St. Magnus, on her way to Lerwick, was visible, so all that was left for us was to bid a hurried adieu to our hosts, and set off to intercept the passing steamer, which we accomplished, as the sea was still smooth.

"No one who knows the kind of structure that is commonly in use as a church in these northern isles will expect to find elegance in the church at Fair Isle. I am sorry to say, however, that it is mean in the extreme, and very far from comfortable."

Fair Isle was long the property of the Sinclairs of Querndale, from which family it passed (as tradition says at a game of brag) to Stewart, of Brough, Orkney. In 1866 it was sold by the representative of that family to its present proprietor.

## NATURAL MAGIC.

BY JOHN NEVIL MASKELYNE.

### IV.—ACOUSTICS.

THE science of acoustics, though little cultivated, is a most valuable one. Sound does not, by any means, "signify nothing," for we owe some of our most pleasing sensations to it. The power of audibly communicating our thoughts, or of appreciating music, is only truly estimated, indeed, by those who have once enjoyed it and then been deprived by deafness of the blessing.

All sound is vibration, and sonorous air-waves travel in ever-widening circles exactly as rings form in water when a pebble is dropped therein; but it can be deflected from its course, obeying much the same laws as light, and presenting some curious effects that come within the scope of our subject. Thus Echo, "the daughter of the voice," is a potent ally in magical arts; she lurks in buildings, grottoes, rocks, forests, and rivers,—

"By whose falls  
Melodious birds sing madrigals,"

and is ever ready mockingly to repeat our words. When the reflecting surface is at such a distance from us that the original and return sounds are not blended, the phenomenon is at its best. At Lurley-Feis, upon the Rhine, the voice is reproduced by echo seventeen times; and at the Villa Simonetta, near Milan, there are thirty or more reverberations.

Dr. Plot speaks of an echo in Woodstock Park that has the peculiarity of repeating seventeen syllables by day and twenty by night. The most noted cavern echo was that at Syracuse, in Sicily. This cave was called the "Ear of Dionysius," and it is said to have been a natural ear-trumpet. Here the tyrant placed his prisoners, whose lightest words could be heard by the sentinel without.

One of the most marvellous of echoes is at our own doors in the Whispering Gallery of St. Paul's Cathedral. Here you turn your face to the wall and speak in a low tone, and the words will be heard upon the opposite side of the dome, but not at any intermediate point. The East Gallery of Gloucester Cathedral has a remarkable echo, as also has the Abbey Church of St. Albans; and the Hall of Secrets, in the Observatory, Paris, gives another striking example of this class of phenomena.

Some of the reflections of sound here named are natural, others artificial. A very curious echo of the latter sort is in the famous Baptistry of Pisa. Sir David Brewster observes that "the architect, Giovanni Pisani, is said to have thus constructed the cupola on purpose. The Pisan cupola has an elliptical form, and when one person whispers in one focus it is distinctly heard by the person placed in the other focus, but not by those who are placed between them. The sound first reflected passes across the cupola and enters the ears of the intermediate person, but it is too feeble to be heard till it has been condensed by a second reflection to the other focus of the ellipse."

In the cathedral of Girgenti, Sicily, a whisper is carried a distance of two hundred and fifty feet. It seems that the focus of one of the reflecting surfaces was, by a malapropos choice, selected for the confessional, and some persons aware of the effect resorted to the other focus to gather the scandalous secrets entrusted by the penitent to the ghostly fathers. It is proverbial that listeners seldom or never hear any good of or for themselves, and it proved so on this occasion, for one of the eavesdroppers, when his wife came to be shriven, listened to the recital of some confessions that led to a domestic catastrophe, and to the revelation of the strange acoustical properties of the building.

The celebrated Marquis of Worcester, the inventor of the steam-engine in its primitive form (the "fire-engine" used at Ffoxhall [Vauxhall] waterworks in 1670), utilised his knowledge of the reflection of sound, according to Dr. W. Hooper, in the construction of a speaking-machine upon this principle; and undoubtedly it can be accomplished, as Sir David Brewster observes, "by means of two concave mirrors placed directly opposite to each other, so that the head of the assistant may be in one of the foci, and the mouth of the trumpet in the other, a hole being made in the partition between the assistant and the figure, corresponding in size and situation to the mirrors, and filled up by a very thin cloth to prevent suspicion." This scarcely, in my view, meets the marquis's idea, which he thus mentions in his "Century of Inventions": "How to make a brazen or stone head, in the midst of a great field or garden, so artificial and natural that though a man speak never so softly into the ear thereof, it will presently open its mouth and resolve the question in French, Latin, Welsh, Irish, or English, in good terms, uttering it out of its mouth, and then shut it until the next question be asked."

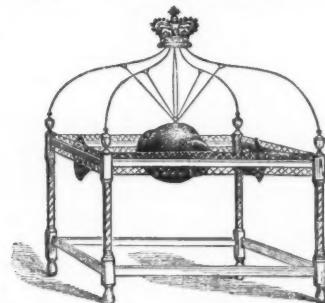
Here we find the machine is to be placed in an open space, and it is difficult to imagine the reflectors would work as in an enclosed place. It is much more likely that the marquis used tubes by which sound can be conveyed for long distances and by devious ways. Even such devices were enigmas once, but they have now left the region of the wonderful for the more steady, if not so brilliant, line of usefulness, performing valuable offices by putting top-floor and basement of our largest hotels and warehouses upon friendly speaking terms.

The first "speaking figure" that we can refer to with certainty as worked upon this principle, was the property of one Irson, an English conjuror, who exhibited the marvellous creation before Charles II. It caused great surprise by its ready and pertinent answers to his Majesty, but one of the pages unfortunately stumbled across the juggler's accomplice in an adjoining apartment, speaking through a tube connected with the figure. The most successful illusion of this kind was that produced in Paris by M. Charles, about 1825, and subsequently in London, and known as "The Invisible Girl." Fig. 1 represents this machine in perspective; it was a fixture in the centre of the floor. A hollow copper ball, about one foot in diameter, was suspended by ribbons from the four bent wires springing from the outer

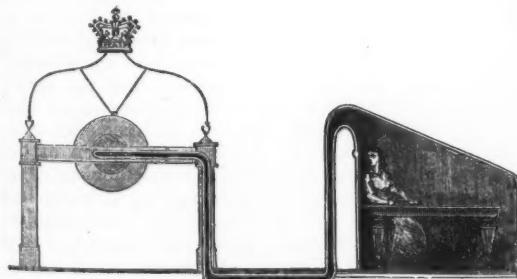
Wood is a good conductor of sound, especially deals and other light varieties. The stethoscope, invented by Laemac, in 1819, by which we can listen to the heart's action, is simply a wooden cylinder. The scratch of a pin on one end of a fallen tree, though so slight that the person who makes it hears no sound, may be noticed at the other end by applying one's ear to the trunk of the tree. Sir Charles Wheatstone carried a concert from the cellar to the garret of a house by means of four deal rods. The lower ends of these rested respectively upon a piano, violin, violoncello, and a clarinet, and they carried the music from these instruments to elastic sounding-boards in "the parlour that's next to the sky," whose vibrations made a murmuring "i' the air" of such strange beauty as to be only comparable to the strains to which, it may be supposed, fairies trip it on the grass.

Sound is likewise conducted by the forehead or teeth through the bony parts of the head. By holding the opposite extremities of a thin piece of wood between their teeth two persons may converse in low tones at some distance from each other, or if you lay your watch upon the table, and retire from it so far as to be out of hearing, its tick will be rendered audible if you take one end of the stick in your teeth and place the other end upon the watch—this, too, though you hold your hands over your ears. So, if you fill your ears with cotton and put your fingers to the teeth of one who speaks (not *between* them, please), you will hear his voice. String will also conduct sound when held between the teeth by two persons; and a "boy's own telegraph" may be constructed by our juveniles without expense. Let them cut the remaining end out of a tin can, such as preserved milk is sold in; stretch a moistened piece of parchment across the aperture, which will tighten like a drumhead when dry. In the middle of this make a small hole and pass a string through it, leaving a knot upon the end which will not go through this aperture. Then at the other end of the twine, which may be a few yards in length, place another can similarly arranged to the previous one. A whisper into the can at one end will be heard by the listener whose ear is applied to the can at the other. If our young friends wish also to bring the tones of the minster bell to their own firesides, they can do so by tying a string round the handle of a poker. Leave two ends to the twine and hold one of these close to each ear, then let some one give the poker a smart blow with a stick.

The boy's telegraph has been named, but the magician's use of the real electric wire for such purposes has not yet been touched upon. Fertile in expedients as is the ready-witted master of "hanky-panky," he would yet be occasionally at a loss for novelties unless he walked hand in hand with science. Electricity, which almost beats time, is really made to do so by the conjuror, who enlists it into his service for his magic drum, his goblin cymbals, and his fairy bells; and it is his henchman, tried and true, when he deceives the ears and eyes of his audience by throwing marked coins into "Aladdin's Crystal Cashbox," suspended from the ceiling. There cannot be any mistake about it! You see the professor go through the action of throwing, and you hear the chink of the money as it drops by some mysterious means within the glass. Alas! we could not quite "see through" that fair-seeming crystal casket; for before it had been brought upon the stage the marked



supports, and to the ball were affixed four trumpets with their mouths outwards. The lips being placed near any of these, a message was sent, and the answer came back in, apparently, a child's voice, but quite audible to those who listened at any of the trumpet-mouths. It is needless to say now that the lady operator sat in another room, and the messages to or from her were conveyed from or to the trumpet-mouths by means of a pipe laid beneath the flooring and passing concealed through the framework to the trumpets. Several other speaking-machines—genuine efforts at obtaining words by



mechanism, and tricks—will be included in my papers upon "Automata,"

coins had been conveyed off, and shut securely, and invisible to the spectator, within its false top. When the casket is slung in the air the wizard apparently throws the real coins towards it, but really only "palms" representative ones. The motion of throwing imposes upon the eyes and misleads the imaginations of the spectators. At the same moment an electric current passes along the wire and releases the spring confining the false top to its position, and the coins thus liberated fall with a rattle on the glass to complete the deception; and very curious it is to the uninitiated when one's own crooked sixpence is found within the box. On the same principle "spirit rapping" can be heard at any place to which electricity can pass by a wire to move a hidden hammer.

The latest marvel, and the most magical addition to the world of science, is in the *Telephone*. Acoustics and electricity united have achieved the seemingly impossible in the electrical transmission of the human voice. The telegraph had "gone on circuit" of the earth for a goodly number of years, and Koenig's inventions had been known for a long time also, before it struck any one that the wires might be made vocal. Koenig made what he called a *Phonograph*, which was a membranous covering stretched over the end of a trumpet and provided with a flexible point. A note sounded at one end caused vibrations at the other, and the point by these means wrote a musical air of seven notes. The same genius also produced "Koenig's flames," by which the visible image of the *timbre*, or quality of sound of the voice, was called forth. His voice in this case acted upon a membrane, whose vibrations were as a bellows to the jet of flame, making it rise and fall. The famous philosopher, Dr. Robert Hooke, of Freshwater, in the Isle of Wight, had visions of the telephone two hundred years ago, but he was before the age of the electrical girdle. Hooke experimented, as did Sir Charles Wheatstone nearer our own time, with light wooden rods carrying the sounds to thin vibrating boards. When he placed musical-boxes in padded chests so that no sound escaped, he could yet convey the tones to a distant sounding-board by his wooden rods. But Dr. Hooke was a little in advance of the times, like Roger Bacon, the Marquis of Worcester, and some others. For the benefit of those who wish to make experiments in private, I may name an excellent trick upon this principle, which causes much astonishment to the uninitiated. Two musical-boxes playing the same airs are required. Place one within a padded box in an upper room, and pass a wire connected with it through the floor and the ceiling of the apartment beneath. At the lower end of the wire hang an empty deal box. Now your duplicate musical-box upon the table in this lower room shall be set going to some particular air, and when it is concluded the same strains may be heard proceeding from the empty box; for by some pre-arranged signal your confederate has started the musical-box in the upper room, and the sound is conveyed down the wire into the box beneath. The first idea of the telephone dawned upon Herr Reiss, a German, in 1852. His original instrument was the hollowed-out bung of a beer-barrel closed with the skin of a Strasburg sausage. A strip of platinum, fixed in its position by sealing-wax, "made" or "broke" the electric circuit. The receiving instrument was a knitting-needle with wire wound round it, and this was placed upon a violin, which acted as a sounding-board. He afterwards made a wooden box

with a trumpet mouth. On the top of this box was a round hole covered with a bladder, and on its upper surface a sheet of thin metal connected with a galvanic battery. When any one spoke through the trumpet the vibrations interrupted the current. This gave out the same sounds at one end that were spoken into it at the other.

This was more scientific, if less powerful, than that apocryphal speaking-trumpet mentioned by Kircher,—"the Horn of Alexander,"—by means of which the soldiers received orders from their commander when he was ten or twelve miles off! Even this fabulous transmitter of vocal sounds has been left a long march in the rear by the latest (the "articulating") telephone of Professor Graham Bell, an English naturalised American, which not alone conveys the tone and pitch of the voice, but its *timbre* also, and that with telegraphic, not mechanical, speed. Round one end of a bar-magnet insulated wire is wound, and the ends of this are connected with screws in the small end of the box. A wire from one screw is "run to earth," the other connected with the telegraph. Between the hole, where is fixed a trumpet-mouth and the magnet, is a very thin disc of soft iron—"the drum of the ear." The other end of the telegraph wire has a precisely similar arrangement. Speaking into the mouth-piece at one end sets the iron disc vibrating, and a current passing along the wire repeats the sounds in every particular—to one whose ear is to the trumpet at the other end—save in being lower in tone; exactly, in fact, as if one spoke through a tube.

The prohibitive royalty fixed upon the use of Professor Bell's beautiful invention in its patented form puts it outside all ordinary pursuits, but there is nothing to prevent persons having it for their private use, and most opticians will furnish you with the instrument at a moderate price.

Professor Barrett has shown how we can ourselves make a telephone at the cost of a few pence. A wooden tooth-powder box has a hole cut through lid and bottom; a disc of tinned iron is fastened between them; a small, straight bar-magnet is put through a silk or small cotton-reel, and fixed near the disc, and round the reel wire is wound. This is the "originator," and the "receiver" is similar. Some trials will be needed to adjust the distances, but the wire between originator and receiver may extend for some hundred yards.

No article upon acoustics would be complete without mention of that kind of familiar spirit which some men carry about with them. This is Ventriloquism; and if its possessor be also a spirit medium, he finds it a valuable addition to his *craft*. Indeed, one Louis Brabant, *valet-de-chambre* to Francis I, being enamoured of a rich heiress, conceived the idea of receiving a direct spirit-message from her deceased father, and his art was so potent that the lady's mother accepted the supposed spirit-command that Louis should marry the heiress. The romance ends, as such stories usually do, with the union of the lovers, so we are not informed whether Madame Brabant was happily mated or not, but it was a bad beginning to end well, we should say. Ventriloquism is said to be the power of producing sound from the larynx without the muscles of the face being moved, and that strength is given to such sounds by a powerful action of the abdominal muscles. This may be so, but the face is never quite motionless in such cases as far as my observation extends. The effects

depend less upon the performer's power of imitation than in his knowledge of the actions and tricks of manner by which he directs attention to the spot from whence the sounds are supposed to proceed. The oft-asserted power of *throwing the voice* is an absurdity; in fact, the difference in the pitch of the voice, by which the sounds are made to come as from a distance, deceives the ear, while the illusion is completed by the gestures of the performer.

The amusing talking dolls we sometimes see are much easier to work than ordinary ventriloquism, where the voice has apparently to be thrown. This is mimicry pure and simple, and the dolls being so near to the performer the words can be produced with little or no movements of the muscles of the face. All kinds of sounds have been imitated by clever ventriloquists. Mr. Love ran through the gamut of the whole farmyard and stable vocabulary, from the high-mettled racer to Neddy Bray, Mr. Bull, Madame Dun Cow, Master Calf, pigs, ducks, and chanticleer. Mr. Thurton's "Odd Folks" were highly amusing, and his ventriloquial production of the cheering of a crowd was a remarkable achievement. Thurton, indeed, was the greatest artist in his line in our time. Neither of these gentlemen, however, were so great as some performers in the past, if we may credit all that has been stated of them, which is hazardous. In the "Memoirs of the Empress Josephine" an anecdote is related of one Thiemet, a ventriloquist, at the time creating considerable sensation in Paris. He was invited to the house of Eugene Beauharnais, where were met to breakfast a gay circle of young officers. Of these, "first one and then another heard himself distinctly called out of the room by the voice of his serving-man, until the whole party had in turn made a fruitless expedition downstairs. Each returned more amazed than another, and it was finally resolved to sally forth in a body. Thiemet, who, not personally known, save as a guest, to any of the party, had all this time continued quietly seated at table, opening his lips only to eat or drink, functions which he seemed to perform with great address, now rose to assist in the search of the invisible serving-men. No sooner had the party reached the hall than the calls, apparently from all different quarters, were repeated. Each scampered off in various pursuit of the supposed culprit, crying out, 'Here! here's the rascal!' till, in the inexplicable confusion, Eugene's loud laugh discovered the whole plot. The greater part received it as a 'passably excellent joke,' but some there were disposed to bestow the chastisement of the innocent valets on the guilty professor."

Even a more amusing story is told of another French ventriloquist, which may take rank with Theodore Hook's famous hoax for its fun, and is without the more disagreeable consequence of that rather ill-natured frolic. It is related of Alexandre, the ventriloquist in question, that passing one day near the now defunct Temple Bar he observed a large load of hay struggling through the gateway. He instantly imitated the cries of a suffocating man, and drew the attention of the passers-by to the muffled sounds. The cart was stopped in its most inconvenient position, and a crowd of persons assisted to unload the hay, the cries of the supposed man within growing fast and furious as the mob worked with redoubled energy. Just as they were getting to the bottom of the cart the moaning ceased, and the workers gave up the man as dead, though

still proceeding to throw the hay into the roadway to the stoppage of all traffic. The cause of the silence, however, was not the sudden decease of the supposed entombed man, but the discreet exit of the ventriloquial joker, who retired before the *dénouement* of the drama.

#### PREDICTIVE METEOROLOGY.

WITHOUT attempting to enter into a general consideration of the laws of storms, we may make a few remarks upon what is known as predictive meteorology. Storms have long been recognised as a part of the great order of nature, subject to law as strictly as any other phase of the handiworks of the Creator. We are very far as yet from a full acquaintance with the details of this branch of atmospheric inquiry; but the main principles are understood so far that conditions of danger can be recognised, and that in 1861 the late Admiral Fitzroy was enabled to initiate his system of storm warnings, which has been improved and extended under the present management of the Meteorological Office. An excellent general outline of the work of this office will be found in a capital little book by Mr. R. H. Scott, F.R.S., the director, "Weather Charts and Storm Warnings." In order, however, to understand even the first principles of predictive meteorology, it must be borne in mind that the great gaseous envelope of the earth which we call the atmosphere has, like the ocean, its currents and tides and waves and eddies. Heat, qualified by hygrometric and electrical conditions, is the exciting cause of the circulation of the atmosphere. Air, when heated by the sun, expands and ascends, and flows from the warmer to the colder regions, and these latter again supply currents which take the place below of the air which has ascended. This is the simple and original cause of the persistent phenomena known as the trade winds, of the periodic monsoons of the Indian Ocean, of the alternating night and day land and sea-breezes. To it we owe also such intermittent but well-characterised winds as the *bisa* of France, the *gallego* of Spain, the *bora* of Istria and Dalmatia, the *mistral* of Southern France, the *sirocco* of Italy, the *harmattan* of the African Atlantic, and the *simeoom* of the Desert. To it are likewise due the seemingly casual and lawless storms. These great disturbances of the atmosphere are now recognised as cyclonic in their character. They have both a rotatory and a forward motion, and, so far as Great Britain is concerned, commonly approach us from the westward.

When a storm has commenced, and its direction is known, it is very easy, by the aid of the electric telegraph, to send warning in advance to the localities it is likely to visit; but this is only a part of the work of a meteorological office. Our meteorologists aim higher than this—they seek to detect the storm in its inception. This is effected by the aid of the barometer. But our readers must be prepared to give up the old belief which has led so many to denounce this instrument as untrustworthy, "that the actual height of the barometer at one station gives a certain indication of the probable direction or force of the wind, or of the character of the weather at that station." What the barometer does is to show the pressure of the atmosphere. The Meteorological Office compares the weather observations re-

ported from different stations, and is thus able to reason from the whole. The "slightest difference of pressure causes motion in the atmosphere," and the greater the difference of pressure, having regard to distance, between two localities—in scientific phrase, the greater the "gradient"—the greater the atmospheric disturbance. Thus we see how the barometer indicates really the direction and force of the wind, and the import of the "isobars," or lines of equal barometrical pressure, on our weather charts.

Barometers and thermometers are instruments now of some antiquity, though it is only of recent date that they have been made absolutely self-registering, so that by strictly automatic means a permanent record can be kept of all their fluctuations. Anemometers are of later origin. As the name implies, they are instruments for measuring, and if desired continuously recording, the force and direction of the wind. There are three principal forms of anemometers; that of the late Dr. Whewell, Mr. Follett-Osler's, and Dr. Robinson's. Osler's instrument measures the force of the wind by receiving the wind pressure on a square plate. Attached to the plate is a spiral spring which "gives" to the pressure, and the amount of the movement of the spring is recorded by a pencil on a strip of paper moved by clockwork. The velocity anemometer most in favour is that of Dr. Robinson. Four hemispherical cups are attached to the ends of a cross of four horizontal and equal arms. The wind drives this cross round a vertical axis, and the speed is indicated on a dial, or traced on paper. A vane may also be made to leave a continuous record of the changes in the direction of the wind.

Anemometers are by no means so largely used in practical meteorology as might be anticipated. They are not adopted generally for the purposes of the daily report of the Meteorological Office. Great difficulties are experienced in placing these instruments in suitable positions, especially in towns, where the buildings produce frequent eddies, and the relations of the indications of pressure-anemometers to the actual pressure exercised by the wind upon buildings and the like has not been thoroughly determined. For these reasons, therefore, the old-fashioned plan of estimating the force of the wind according to the judgment of the observer is still adhered to. The observations are recorded in the terms of what is known as the Beaufort scale, devised by the late Admiral Sir Francis Beaufort, but itself an adaptation of a rough-and-ready system of nomenclature in use among sailors two centuries since, and which recognised twelve gradations of wind force, from a "stark calm" to a tempest. The terms of the Beaufort scale, with the velocity in miles per hour which they indicate, are as follows:—0, calm, 3 miles; 1, light air, 8 miles; 2, light breeze, 13 miles; 3, gentle breeze, 18 miles; 4, moderate breeze, 23 miles; 5, fresh breeze, 28 miles; 6, strong breeze, 34 miles; 7, moderate gale, 40 miles; 8, fresh gale, 48 miles; 9, strong gale, 56 miles; 10, whole gale, 65 miles; 11, storm, 75 miles; 12, hurricane, 90 miles. These are not average velocities, but intended to represent actual velocities per hour, and the speed of the wind may greatly exceed this scale limit of ninety miles. Indeed, the maximum speed of a cyclone, rotation and translation, has been calculated at 180 miles; and while a wind pressure of 80lb. per square foot has been registered, the actual wind-work done has shown that this also must have been largely exceeded.

## Varieties.

**PAPER MANUFACTURE.**—In a lecture at the Society of Arts, Edinburgh, Mr. Arnot, C.E., stated that the number of mills in Britain was 385, of which 65 were in Scotland. There were in these mills 526 machines at work, producing annually 350,000 tons of paper, to which must be added 10,000 tons made by hand. The total production was thus 360,000 tons, valued at 20 millions sterling. Our exports amounted to 16,000 tons, while we imported 24,000 tons. With respect to the consumption of paper in different countries, Mr. Arnot stated that in Russia the annual consumption was 1lb. per head of the population; in Spain, 1½; Mexico and Central America, 2; Italy and Austria, 5; France, 7; Germany, 8; United States, 10½; and Britain, 11½.

**INFECTIOUS DISEASES.**—In Edinburgh the public are informed by notices and advertisements that every assistance will be given on application to the Public Health Office, Police Chambers, High Street, in removing to the Royal Infirmary, or other hospital, cases of infectious disease; also in fumigating rooms occupied by the sick, and in removing for thorough disinfection articles of bedding and clothing, etc. Letters or personal application receive immediate attention. In London there is great need for similar advice and assistance. Patients are moved in common cabs; and there is not sufficient care taken in compelling cases of infectious disease to be reported, or in removing infected clothes. Every police district ought to have a well-organised department of public health.

**POSTAL TELEGRAMS.**—The Postmaster-General issues the following notice to the public:—"The address of the sender of a telegram is not required for any purpose of signalling, and should be omitted in all cases where the addressee will be able to identify the sender without. For reference, the address should be added at the bottom, or on the back of the message form. In sending telegrams, firms and public companies should adopt their briefest 'style,' and should avoid the use of stamps containing full name, title, and address. The prefixes 'Mr.' and 'Messrs.' and the affixes 'Esq.,' 'Limited,' etc., should be omitted, as far as possible, in the addresses of both senders and addressees. Brevity in these respects insures swifter transmission without any attendant risk."

**ROYAL VISIT TO THE CITY IN 1849.**—The first occasion when the Prince of Wales and the Princess Royal appeared at a public ceremony is described in a letter of Lady Lyttleton, the governess in the Royal Household. It was written a few days after the 30th of October, 1849, when the New Coal Exchange had been opened. "It was magnificent, and delightful to see and hear. The weather was Italian. Not a bit of fog or cold or wind. St. Paul's seen as clearly as a country church up to the cross, and on the cupola sat many people. Every inch of ground, every bridge, roof, window, and as many vessels of all sorts as could lie on the river, leaving an ample passage clear, were covered, close packed with people. And the thought that all were feeling alike—both for the Queen and the poor little fair-headed child they cheered—was overpowering. He and his sister behaved very well, civilly and nicely. The Prince was perfect in taste and manner, putting the Prince of Wales forward without affectation, and very dignified and striking himself. The most striking to me was, after landing, the procession along a covered gallery which held many thousand people each side of the Prince and children. The cheers to us, and the countenance of every one looking so affectionately, quite like parents, and the two little creatures stretching over one another to see and smile at them, I can never forget. The rotunda is handsome, and was filled all over with people in full dress, like the opera house, and they made a thundering applause, clapping hands as soon as the Royal party came in. . . . What a curious thing is that loyalty! And how deep and strong in England! The Queen was wretched at being prevented from going to see the children received on their first State occasion. Everybody in full-dress liveries like the State drawing-rooms, and all sorts of old feudal City customs. The swans, *live ones*, in their barge (with their keeper); the Lord Mayor, quite dazzling, just ahead of ours; and he and all the functionaries in new robes of scarlet cloth or crimson velvet. And such floods of sunshine all the time, and an incessant thundering of 'God save the Queen' by a succession of bands, and the bells and the Tower guns enough to drive one mad."

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APRIL, 1878.

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On Sunday Morning, May 5th, 1878, by the Rt. Rev. the BISHOP OF SODOR AND MAN, at

ST. MICHAEL'S CHURCH, CHESTER SQUARE, S.W., Divine Service to commence at Eleven o'clock.

And by the Rev. DAVID MC EWAN, D.D., at TRINITY PRESBYTERIAN CHURCH, CLAPHAM ROAD, S.W.  
Further particulars to be announced.

### PUBLIC MEETING.

The Public Meeting will be held on Friday Evening, May 3rd, at Exeter Hall, commencing at 6.30 o'clock. Amongst the speakers will be the Rev. CANON FLEMING, B.D.; the Rev. NEWMAN HALL, LL.B.; the Rev. JOSEPH WELLAND (from India); the Rev. THEODORE MONOD, of Paris; and JOHN MACGREGOR, Esq. (Rob Roy).

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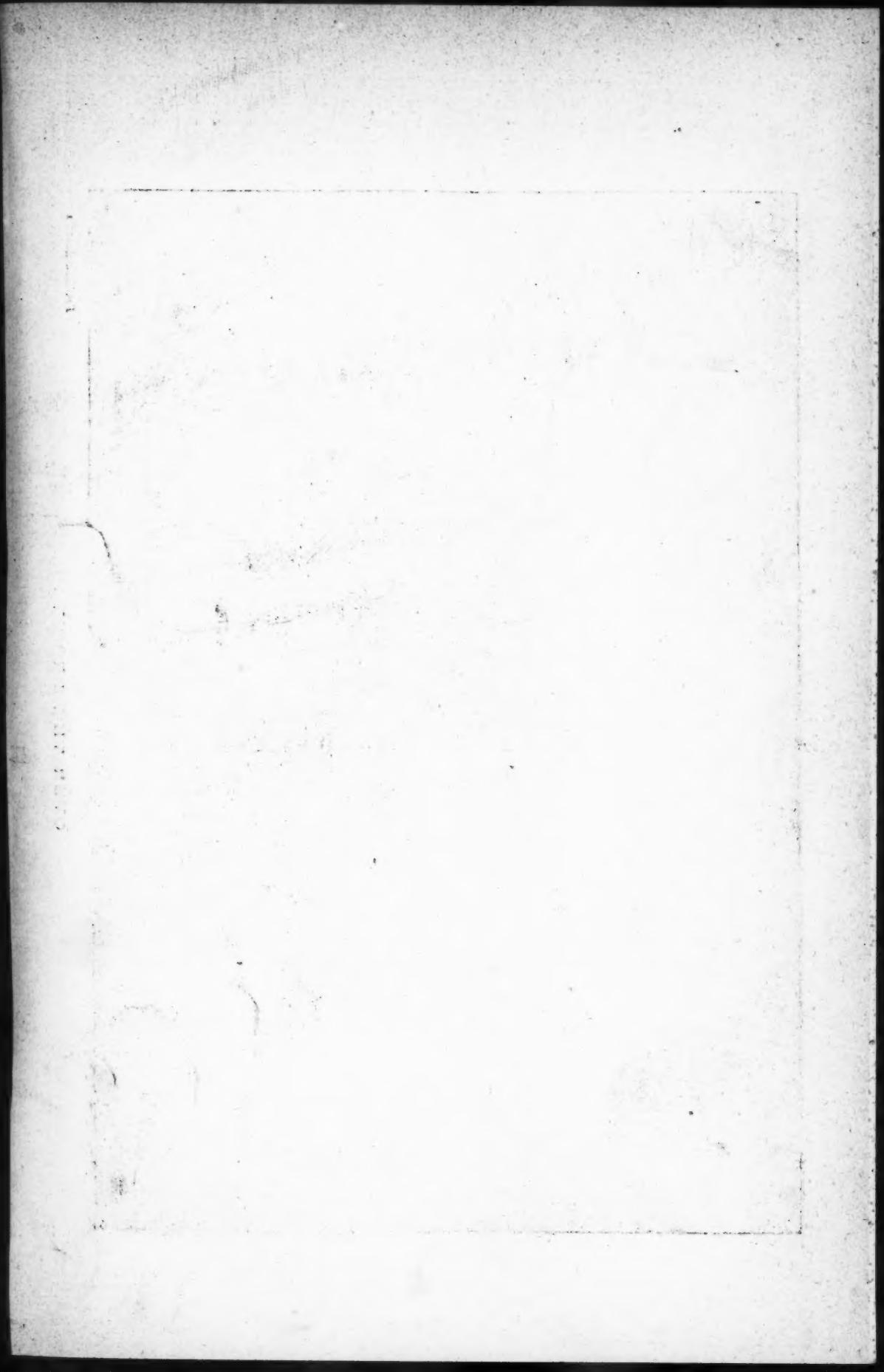
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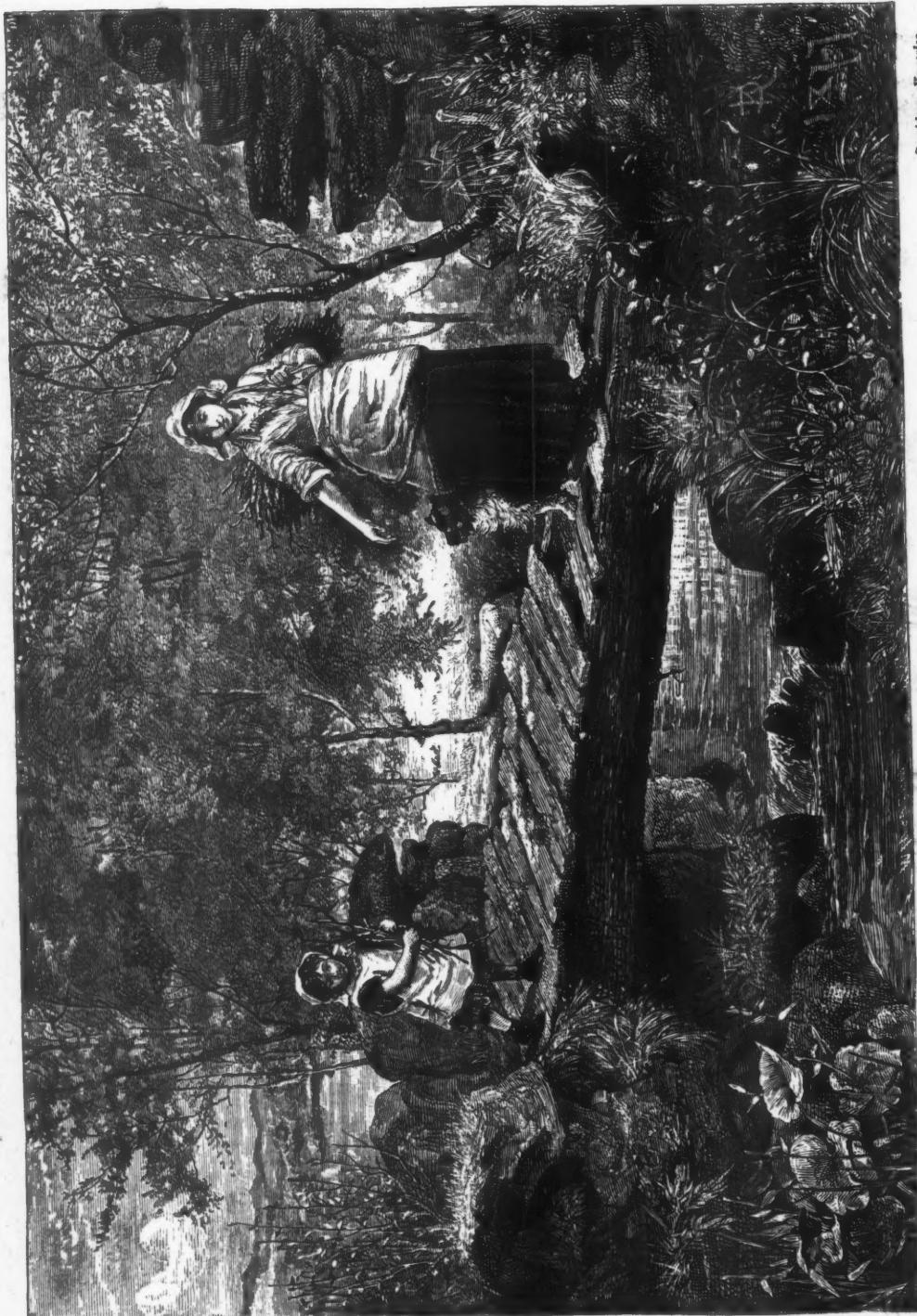
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